AMERICAN SOCIETY FOR TESTING MATERIALS

BULLETIN

260 SOUTH BROAD STREET PHILADELPHIA, PA.

"Promotion of Knowledge of Materials of Engineering and Standardization of Specifications and Methods of Testing"

NUMBER 73 March 22, 1935

Outstanding Annual Meeting in Prospect

Interesting Technical Program Being Developed—Detroit Committee Actively Perfecting Its Plans

WHEN considered from the standpoint of the very interesting technical program which is being developed by the Committee on Papers and Publications and the plans for various features of the annual meeting being worked up by the Detroit Committee on Arrangements, plus the very noticeable increase in appreciation of the importance of Society work, it can be safely predicted that the Thirty-eighth Annual Meeting to be held in The Book-Cadillac, Detroit, June 24–28, will be an outstanding one in many respects.

The number of applications for space in the Exhibit of Testing Apparatus and Related Equipment and the participation of a number of A.S.T.M. Committees insures a most interesting exhibit.

While complete details of the program for the meeting will appear in the form of a Provisional Program in the April BULLETIN, there are certain developments of interest of which preliminary announcement can be made at this time.

And its February meeting, the Committee on Papers and Publications reviewed the large number of offers for papers which were submitted. As in the past, the committee had a perplexing problem to solve in order to make room on the program for so many interesting papers, but by assigning a definite space limitation on the various items more papers can be accepted than could otherwise be the case.

Program

Mention has been made of one session dealing with the subject "The Place of Materials in Automobile Roads and Rides." An outstanding authority will present a paper on each of these three phases: the automobile, rubber (tires, etc.) and highways. This session will probably be held on Tuesday evening, June 25.

Following the annual dinner on Wednesday night, there will be addresses on pertinent aspects of the housing situation. A leading executive of the Federal Housing Administration is to speak and the Detroit Committee plans to have a second paper presented by one of the country's leading specialists in the field of housing developments.

A.S.T.M. Committee E-2 on Spectrographic Analysis has requested that one session of the meeting be devoted to the five or six formal technical papers which they will develop on this general subject. Increasing use of the spectrograph would indicate that this session will be of widespread interest.

Another feature of the program will be a round-table session on the subject of radiography and X-ray crystallography. The committee developing this discussion expects that next year a formal symposium will be held on the subject.

In addition to these features a large number of other excellent papers will be included in the program covering topics in the field of ferrous and non-ferrous metals, cement and concrete, and masonry materials.

In so far as possible synopses of the papers and reports will be given in the Provisional Program. Preprints of the various papers and reports will be available to the members in advance of the meeting and will be distributed in the customary way—each member receiving a request blank on which he may indicate the items he wishes to receive, preprints being sent only to those members who request them.

Edgar Marburg Lecture

The 1935 Edgar Marburg Lecture, the tenth one to be delivered, will of course be a feature of the meeting. It is expected that this will be given Wednesday afternoon. Dr. L. B. Tuckerman, Principal Scientist (Engineer-Physicist), National Bureau of Standards, has accepted the invitation to deliver the lecture. His subject, the title of which will be announced later, will be in the general field of development and application of materials in the aircraft industry. Doctor Tuckerman has taken an important part in a number of activities in connection with the design and construction of aircraft and is a member of several subgroups of the National Advisory Committee for Aeronautics.

Exhibit of Testing Apparatus

Many of the leading companies interested in testing apparatus and related equipment fields have applied for space in the Society's Third Exhibit which will be open throughout the five days of annual meeting week. A number of very interesting displays are being planned. In addition to these, several Society committees have indicated their desire to participate and various displays will indicate interesting phases of their work, including development of special apparatus, etc.

Ladies' Entertainment Program

The wives and families of A.S.T.M. members are particularly invited to attend the annual meeting. A very interesting entertainment program is being planned with definite events on each day of the meeting. There are many interesting things to see in the Detroit area, such as Greenfield Village at Dearborn, Cranbrook Educational Institution, Belle Isle, etc., and the ladies can anticipate a most pleasant week. Full details will be announced later.

The program is in charge of a group of ladies from various organizations who have united under the Detroit Engineering Society's leadership to form the A.S.T.M. Ladies' Entertainment Committee, as announced in the January BULLETIN. Mrs. F. O. Clements is Chairman and Mrs. J. E. Williams, Vice-Chairman.

Reduced Railroad Rates

Application is being made to the railroad passenger associations for reduced round-trip rates for the annual meeting. It is probable the identification certificate plan will be used—the certificate being mailed from the Headquarters office to each member—with additional ones on request for use of members' families and associates. Full details will be announced later.

Hotel Accommodations

The Book-Cadillac Hotel, where the meeting and exhibit will be held, with its 1200 rooms should be able to accommodate the members to their complete satisfaction. A large number of amply equipped meeting rooms are available for Society sessions and for the committee meetings which will be held during the week. The hotel has four restaurants.

The hotel rates range from $3, single; $4.50, double with double bed; and $5, double with twin beds. The hotel has arrangements so that if four or more of the members desire to take one of the hotel's large rooms single beds will be provided with a large private bath, plenty of closet space and adequate equipment for the occupants at $2 per person.

Members who wish to make reservations immediately can do so by addressing the hotel management. Reservation cards will be distributed to each member with the April BULLETIN.

Vice-President Fieldner Addresses Cleveland Meeting

A very successful local meeting was held in Cleveland on March 15 at which Vice-President A. C. Fieldner spoke. The meeting was under the auspices of the A.S.T.M. Cleveland District Committee and the Cleveland Purchasing Agents' Association. The attendance was about 125, a number of men coming from Akron, Youngstown and other cities in the Cleveland District.

Dr. H. A. Schwartz, chairman, Cleveland District Committee presided and presented Mr. Fieldner who spoke on "What the A.S.T.M. Can Do for the Purchasing Agent."

After tracing the need for specifications on the part of industry and tracing steps in their development, Mr. Fieldner indicated the wide range of A.S.T.M. standards. He described the functioning of a committee showing that all interests including the purchasers and users must be adequately represented on each of the committees. It was indicated that in order to develop necessary information on which to base an adequate standard exhaustive tests are often essential.

In addition to mentioning various groups of the over 700 standard and tentative specifications and tests which A.S.T.M. has issued, Mr. Fieldner outlined certain of the symposiums which developed authoritative information on particular materials, at the same time indicating how these data are of great help to industry and those concerned with buying and selling of various kinds of materials under established specification requirements. In order to illustrate the widespread cooperation in the development of satisfactory standards, Mr. Fieldner described in some detail the work of the Society's Committee on Coal and Coke, of which he is chairman, and showed how such groups as the American Standards Association, American Gas Association and others cooperated in the standardization work.

In closing the meeting, Doctor Schwartz emphasized the buyer's interest in specifications and indicated the savings to be realized in various directions through a use of specifications of internationally recognized bodies such as A.S.T.M.

New York Meeting Hears Professor Taylor

An interesting and very well attended meeting was held in New York City on March 14 at which Prof. Hugh S. Taylor, Head, Department of Chemistry, Princeton University, spoke on "The Chemistry of Deterioration." About 400 members of the Society and their guests and others interested in the subject attended the meeting which was considered one of the outstanding local meetings yet held. The meeting was sponsored by the New York District Committee with A.S.T.M. Committee D-9 on Electrical Insulating Materials cooperating. An informal dinner attended by members of the New York District Committee and guests preceded the meeting. Dr. M. F. Skinker, new chairman of the New York District Committee, opened the meeting and presented Past-President K. G. Mackenzie who introduced the speaker.

Professor Taylor's subject was one of much interest and concern to those attending the meeting. His address was very informative and it also indicated the desirability of continued research in this field which has great potentialities, not only from a monetary point of view, but from the standpoint of advancing knowledge of the causes and prevention of deterioration. It was not found possible to present an abstract of his address in this BULLETIN and it is planned to include this in the April issue.

District Committee Reorganizes

This successful local meeting was the first major activity undertaken by the reorganized New York District Committee. The committee at its reorganization meeting held a few weeks in advance perfected its plans and announcement was made of the personnel of the committee as follows:

Terms Expiring June, 1935

D. A. Abrams, Consulting Engineer, New York City
R. L. Bertin, Chief Engineer, White Construction Co.
F. M. Farmer, Vice-President and Chief Engineer, Electrical Testing Laboratories
Prévost Hubbard, Chemical Engineer, The Asphalt Institute
C. S. Reeve, Manager, Research Development, The Barrett Co.

Terms Expiring June, 1936

W. H. Finkeldey, Metallurgist, Singmaster & Breyer
L. F. Rader, Assistant Professor of Civil Engineering, Brooklyn Polytechnic Institute
G. O. Hiers, Chemist, National Lead Co.
D. T. May, Materials Engineer, Bell Telephone Laboratories, Inc.
C. A. Lunn, Chief Chemist, Consolidated Gas Co. of New York

Terms Expiring June, 1937

H. S. Vassar, Laboratory Engineer, Public Service Electric and Gas Co.
W. H. Bassett, Jr., Technical Superintendent and Metallurgist, Anaconda Wire and Cable Co.
R. M. Wilhelm, Technical Adviser, C. J. Tagliabue Manufacturing Co.
M. F. Skinker, Assistant Director of Research, Brooklyn Edison Co.
L. C. Beard, Socony-Vacuum Oil Co., Inc.

M. F. Skinker was elected chairman of the committee; W. H. Finkeldey, vice-chairman and L. C. Beard, Jr., secretary.

Appointment of Representatives

The appointment of the following Society representatives is announced:

J. R. FREEMAN, JR., Technical Department, American Brass Co., has been appointed on the Non-Ferrous Metallurgical Advisory Committee to the Bureau of Standards to replace W. H. Bassett, deceased.

R. E. DAVIS, Professor of Civil Engineering, University of California, has been appointed a representative of the Society on the Sectional Committee on Recommended Practice for Brick Masonry.

Large Audience Hears Papers on Paint

Successful Regional Meeting Held with Much Interest in Technical Program

ONE of the Society's most successful regional meetings was held in Philadelphia on March 6. The technical feature, a Symposium on Paints and Paint Materials, was developed by Committee D-1 on Preservative Coatings with a special committee headed by R. L. Hallett, Chemist, National Lead Co., in charge of securing and reviewing the papers. The fifteen papers which were presented aroused considerable interest and discussion among the large number of technologists present at the two sessions, morning and afternoon. About 400 were in attendance at each session, many of the paint companies and plants in Philadelphia sending a number of their representatives to the meeting.

Each of the authors prepared his paper from a broad viewpoint discussing the various phases of his subject so that the information and data when published would be of particular interest and assistance from the viewpoint of the consumer as well as those concerned with production. In the opinion of a number of those present the symposium, in addition to making available authoritative information, indicated the very considerable progress which has been made in the paint industry and at the same time indicated fields where there may be important future developments.

The papers in the symposium were as follows:

LOOKING INTO THE FUTURE—H. A. Gardner, Chemical Engineer, The Institute of Paint and Varnish Research

PREPARATION, USE AND ABUSE OF SPECIFICATIONS FOR PAINT MATERIALS—P. H. Walker, Acting Chief, Chemistry Division, National Bureau of Standards

PROTECTIVE AND DECORATIVE COATINGS FOR RAILWAY PASSENGER CAR EQUIPMENT—A. M. Johnsen, Engineer of Tests and Chemist, The Pullman Co.

PAINT TESTING—C. D. Holley, Director of Paint Research, The Sherwin-Williams Co.

VARNISH TESTING—W. R. Fuller, Technical Director, Pratt & Lambert, Inc.

LACQUER TESTING—H. E. Eastlack, Director, Parlin Laboratory, E. I. du Pont de Nemours and Co.

DRYING OILS—S. O. Sorensen, Chemist, Archer-Daniels-Midland Co.

ZINC PIGMENTS—E. H. Bunce, General Manager, Technical Dept., The New Jersey Zinc Co.

LEAD PIGMENTS—R. L. Hallett and C. H. Rose, Chemists, National Lead Co.

TITANIUM PIGMENTS—I. D. Hagar, Eastern Sales Manager, Titanium Pigment Co.

THE MINERAL EARTH COLORS AND SYNTHETIC IRON OXIDES—J. W. Ayers, Director of Research, C. K. Williams and Co.

CHEMICAL COLORS—A. F. Brown, General Manager, Imperial Color Works

NATURAL AND SYNTHETIC RESINS—W. T. Pearce, The Resinous Products and Chemical Co.

LACQUER SOLVENTS AND VOLATILE THINNERS—R. M. Carter, Research Chemist, U. S. Industrial Alcohol Co.

TURPENTINE AND PETROLEUM DISTILLATES AS THINNERS FOR VARNISH AND PAINT—J. M. Schantz, Manager, Technical Service, Naval Stores Dept., Hercules Powder Co., Inc.

G. B. Heckel, Editor-Publisher, *Drugs, Oils and Paints*, was honorary chairman at the meeting and P. H. Walker, Acting Chief, Chemistry Division, National Bureau of Standards, served as chairman, with Mr. Hallett serving as co-chairman. Much of the sustained interest during the meeting can be attributed to the effective way in which they handled the program.

The Program Committee which developed the symposium consisted of the following: R. L. Hallett, *Chairman*, National Lead Co.; W. R. Fuller, Pratt & Lambert, Inc.; H. A. Gardner, The Institute of Paint and Varnish Research; H. A. Nelson, New Jersey Zinc Co.; W. T. Pearce, The Resinous Products and Chemical Co.

It is planned to publish the papers and oral and written discussion during the summer, as a separate publication and further announcement will be made concerning it. Members and others who wish to submit written discussion of any of the papers or on the subject of the symposium should write the Secretary-Treasurer immediately.

Dinner and Franklin Memorial Trip

Following the afternoon session of the meeting a dinner was served at which about 100 members and their guests were present. C. A. Bonine, Associate Director in Charge of Engineering, The Franklin Institute, described the work of the Institute pointing out particular phases which would be of special interest to A.S.T.M. members. After the dinner the members visited the Institute Memorial Museum and the Planetarium. Some of the earliest testing machines, on display in the Museum, received special attention.

Considerable credit for the success of the 1935 Regional Meeting and Committee Week should be given the Philadelphia District Committee which handled arrangements for the dinner, registration, institute visit, etc. The personnel of this group follows:

H. M. Hancock, *Chairman*, The Atlantic Refining Co.
Alexander Foster, Jr., *Vice-Chairman*, Warner Co.
Harold Farmer, *Secretary*, Philadelphia Electric Co.
G. H. Clamer, The Ajax Metal Co.
C. N. Forrest, The Barber Asphalt Co.
W. H. Fulweiler, United Gas Improvement Co.
N. L. Mochel, Westinghouse Electric and Manufacturing Co.
W. T. Pearce, Resinous Products and Chemical Co.
J. B. Sidebotham, Jr., John Sidebotham, Inc.
A. R. Wilson, Pennsylvania Railroad Co.
L. G. Wilson, Precision Thermometer and Instrument Co.
G. H. Woodroffe, Reading Iron Co.

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Refractories Committee Meets in Buffalo

At its meeting in Buffalo in February during the annual meeting of the American Ceramic Society, A.S.T.M. Committee C-8 on Refractories took a number of actions on the work in its jurisdiction. It was decided to recommend the adoption as standard of the Tentative Method of Chemical Analysis of Magnesite Refractories (C 18 – 21) and the Tentative Definitions of Terms Relating to Refractories (C 71 – 34 T), and also the existing tentative revisions in the Standard Method of Test for Softening Point of Fire-Clay Brick (C 24 – 33) and Standard Definition for Clay Refractories (C 27 – 28).

At the previous meeting of the committee there had been considerable discussion on the question of adopting a series of pyrometric test cones with uniform temperature intervals. At its Buffalo meeting the committee decided to recommend to the Standard Pyrometric Cone Co. that efforts be made to establish a new series of test cones with uniform temperature intervals.

A report was received at the meeting on the studies involving microscopic analysis of refractories and there was discussion of research work which is under way on the development of a new load test furnace where the loading will be direct instead of by a lever.

III. Long-Time Society Committee Members

Third in a Series of Notes on Long-Time A.S.T.M. Members

FOLLOWING the plans announced in previous BULLETINS, there are given below notes on the outstanding activities of three long-time members of the Society. In general the men whose work is outlined in this series of articles have been affiliated with A.S.T.M. for twenty-five years or more and have taken an active part in committee work over long periods of time. No particular sequence is being adhered to in this series.

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ALLAN W. CARPENTER, Engineer of Bridges, New York Central Railroad (Buffalo and Eastern), has been with this organization since 1900. A graduate of the Case School of Applied Science in the civil engineering course, 1895, he was for the following five years in the employ of The Osborn Co. of Cleveland as inspector of bridge and building steel fabrication and erection and of bridge masonry construction; and as structural field engineer and bridge designer. From 1900, excepting for a few years of service as supervisor of bridges and buildings and as division engineer of track and structure maintenance and construction, Mr. Carpenter's headquarters have been in New York City. For a period of about nineteen years, 1913–1932, he was engaged in valuation work in connection with the Federal Valuation of Railroads. He has held various positions including bridge engineer, engineer of structures, and assistant valuation engineer. He was appointed to his present position in 1932.

Mr. Carpenter has been a member of A.S.T.M. since 1908. A member of Committee A-1 on Steel since 1913, he has been chairman of one of its most important subcommittees, II on Structural Steel for Bridges, Buildings and Rolling Stock since 1922. His membership on Committee D-1 on Preservative Coatings for Structural Materials dates from 1914 and as chairman of Subcommittee XIV on Preparation of Iron and Steel Surfaces for Painting, he has taken a leading part in the very active program of work which this committee developed. He is interested in the work of Committee A-5 on Corrosion of Iron and Steel, member since 1916.

Mr. Carpenter is the representative of the Society on the A.S.C.E. Steel Committee of its Structural Division. He is interested in the work of other societies, and is a member of the A.S.C.E., A.R.E.A. and American Welding Society. He represents the A.R.E.A. on the A.S.T.M. Research Committee on Yield Point of Structural Steel.

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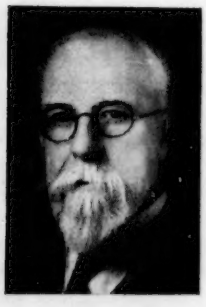

RUDOLPH P. MILLER, Consulting Engineer, New York City, received the civil engineering degree from Columbia University in 1888 and on the occasion of the fiftieth anniversary celebration of the School of Mines he was awarded the honorary degree of Master of Science. He also holds the degree of Bachelor of Science from the College of the City of New York, 1885. Following a period of service with the old Richmond and Danville Railroad and with the Long Island Railroad, he in 1895 was engaged by the city of New York, Department of Buildings, becoming engineer in charge of technical work. He resigned in 1906 to go into private practice covering design of steel and concrete buildings, reports on structural safety of existing buildings, investigation of building failures, etc.

Following his appointment as superintendent of buildings for the Bureau of Manhattan, 1910, he was appointed in 1914 to revise the New York Building Code and in 1916 became chairman of the Board of Standards and Appeals. After a period of service during the World War as engineer with United States Housing Corporation, he returned to private practice, until in 1920 he again became superintendent of buildings for Manhattan. Since 1922 he has been in private practice as consulting engineer.

Mr. Miller's membership in the Society dates from 1903. He was the first secretary of the forerunner of Committee C-5 on Fire Tests of Materials and Construction and served until 1928 from which time he has been chairman. His membership on Committee C-10 on Hollow Masonry Building Units dates from 1915, the year of its organization, and when Committee C-11 on Gypsum was organized in 1914 he became a member. He has served as vice-chairman of this committee since 1916.

Mr. Miller is chairman of the Sectional Committee on Fire Tests and he heads the Committee on Zoning of the National Fire Protective Association. He served as president of this latter association for two years and for ten years was president of the Building Officials Conference.

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G. W. THOMPSON, has been Chief Chemist, National Lead Co., since 1892. In 1916 he became director of the company and is at present a director and officer of a number of subsidiary corporations. In 1927, the Armour Institute of Technology conferred upon him the degree of Doctor of Science.

Doctor Thompson's membership in the Society dates from 1903 when he also was elected to membership on Committee D-1 on Preservative Coatings for Structural Materials, in the work of which he has taken a most active part. During the period when he was secretary of the committee, 1910–1920, D-1 had under way one of the most extensive series of test programs which any A.S.T.M. group has ever undertaken, including the tests at Atlantic City, Annapolis, Havre de Grace and other programs. From 1909 to 1911 he was in charge of extensive work, developing reliable data and adequate specifications for linseed oil.

He has been a member of Committee E-8 on Nomenclature and Definitions since its organization in 1920 serving as Vice-Chairman from 1921 and he was chairman of the D-1 Subcommittee on Definitions from 1911 to 1920.

Doctor Thompson has the distinction of having served twice on the A.S.T.M. Executive Committee, 1912 to 1913 and from 1916 to 1918. He was Vice-President in 1926 and became President of the Society in 1928. He holds membership in a number of scientific and technical societies in addition to A.S.T.M., including A.A.A.S., American Chemical Society, Society of Chemical Industries and the American Institute of Chemical Engineers of which he was president in 1918.

Many Committees Participate in Spring Group Meetings

Well-Attended and Active Sessions Mark Committee Week

DURING A.S.T.M. Committee Week, held in Philadelphia at The Warwick hotel, from March 4 to 8, there were upwards of 135 meetings of main committees, sections and subcommittees. Most of the meetings were unusually well-attended and the total registration for the week, 615, exceeded that for any of the Spring Group Meetings the Society has yet held. Registration at Washington, last year, reached 584, the previous high.

The success of the meetings should not, of course, be evaluated on attendance records. Many constructive actions were taken by the committees and a great deal of progress was made in furthering the Society standardization and research programs.

The following committees took part, with in the case of most of the standing committees listed, a number of subcommittee meetings:

A-1 on Steel
A-2 on Wrought Iron
A-3 on Cast Iron
A-4 on Heat Treatment of Iron and Steel
A-5 on Corrosion of Iron and Steel
A-10 on Iron-Chromium, Iron-Chromium-Nickel and Related Alloys
B-1 on Copper Wire
B-2 on Non-Ferrous Metals and Alloys
B-3 on Corrosion of Non-Ferrous Metals and Alloys
B-5 on Copper and Copper Alloys
B-6 on Die-Cast Metals and Alloys
B-7 on Light Metals and Alloys
C-3 on Brick
C-4 on Clay Pipe
C-10 on Hollow Masonry Building Units
D-1 Subcommittees
D-2 on Petroleum Products and Lubricants
D-4 on Road and Paving Materials
D-5 on Coal and Coke
D-8 on Bituminous Waterproofing and Roofing Materials
D-11 on Rubber Products
D-15 on Thermometers and Laboratory Glassware
E-1 Subcommittees
E-4, Sub. I on Preparation of Samples
Research Committee on Fatigue of Metals
Subcommittee on Low Temperatures of Joint ASME-ASTM Research Committee
Joint AES-ASTM Committee on Specifications for Plating on Steel
Joint AES-ASTM Committee on Exposure Tests of Plating on Non-Ferrous Metals
Sectional Committee on Zinc Coating of Iron and Steel

A large number of proposed standards were offered by the committees with recommendations that they be published as tentative and several existing tentative specifications and revisions were proposed for adoption as standard. Many of the actions outlined below are subject to letter ballot approval of the respective standing committees, prior to submission to the Society at the annual meeting in Detroit, June 24–28.

The following condensed accounts of some important features of the various committee activities will indicate some of the progress made and at the same time provide, in a number of cases, an idea of work-programs to be developed in the near future.

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Committee A-1 on Steel.—The Specifications covering Open-Hearth Carbon-Steel Rails (A 1 – 30) are to be revised to include details of drop testing equipment and definite descriptive revisions covering "O" and "M" positions. This information is considered important because of the wide use of this standard in export trade. Changes will be incorporated in the standard covering quenched high-carbon-steel splice bars, to bring the chemical and physical properties in conformity with railroad specifications.

Progress was indicated in the work to develop requirements for high-strength rivet steel for use with structural silicon steel and the revision of specifications covering structural nickel steel. A proposed draft of a recommended practice covering conditioning of rolled steel surfaces of structural steel by welding was discussed and with revisions probably will be reported at the next meeting in Detroit.

It was recommended that the Tentative Specifications for Heat-Treated Steel Elliptical Springs (A 147 – 33 T) be adopted as standard. Changes are also contemplated in the requirements for chromium content in the Specifications for Chrome-Vanadium-Steel Bars for Railway Springs (A 60 – 27). The question of the permissibility of cold cambering of spring leaves under the requirements in A 147 will be given further study.

A proposed specification covering axle steel concrete reinforcement bars was presented and following a favorable letter ballot will be submitted to the Society for publication as tentative. The requirements cover two classes of bars, plain and deformed, in three grades, structural-steel, intermediate and hard. The bars are to be rolled from carbon-steel axles for cars and locomotive tenders. No other material is to be used. Carbon determination of each axle is to be made by the manufacturer. The tensile properties provide, for the plain bars, 55,000–70,000 lb. per sq. in. tensile strength in structural grade; 70,000–90,000 intermediate grade; 80,000 minimum, hard grade. The tensile requirements for deformed bars are the same, respectively. Yield points are 33,000, 40,000 and 50,000 lb. per sq. in., respectively, for the three grades. The provisions require one tension and one bend test from each lot of ten tons or less of each size of bar rolled from each lot of axles sorted in groups as covered in the specifications.

Criticism was raised at the meeting on certain requirements in the Tentative Specifications for Carbon-Steel Castings for Industrial, Railroad and Marine Uses (A 154 – 33 T) which it was thought would eventually replace the Standard Specifications for Carbon-Steel Castings (A 27 – 24) and for Carbon-Steel Castings for Railroads (A 87 – 27). It was decided to recommend the withdrawal of specifications A 154, the standards A 27 and A 87 being still in effect and a subcommittee will prepare drafts of specifications to cover separately different grades of carbon-steel castings, including castings made of steel suitable for welded structures.

As a result of work extending over two years, Subcommittee IX recommended that proposed specifications covering seamless low-carbon-steel still tubes for refinery service be published as tentative.

These specifications cover Seamless Hot-Rolled and Cold-Drawn Low-Carbon Steel Tubes for carrying oil at elevated temperatures and pressures in various types of oil stills in which the tubes may be subjected to a furnace temperature higher than that of the contained fluid, in sizes 2 in. O.D. or larger and of heavier than No. 5 B.W.G. minimum or ¼ in. average wall thickness.

A number of revisions consisting of additions to the range of sizes and gages up to and including 10 in. outside diameter and the deletion of sizes over 10 in. outside diameter were asked in the tables of the Specifications for Lap-Welded and Seamless Steel and Lap-Welded Iron Boiler Tubes (A 83 – 34). A proposal to substitute manufacturing weights for the present theoretical weights was considered but the

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American Society for Testing Materials

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District Committees and Meetings

WITH the adoption of a Charter for District Committees, as given in full in the December BULLETIN, providing a more permanent basis for the committees and greater autonomy, several of the District Committees have reorganized, including those in New York, Cleveland, and Pittsburgh, and the others are expected shortly to announce completion of this preliminary step. These committees and the activities they will undertake are very important in the Society's scheme of things.

It is expected that these committees may sponsor so-called "local" meetings (see page 2). These provide an opportunity for members in the respective districts to further their acquaintance with other A.S.T.M. men and to enlarge their other contacts. Discussions by leading technologists of engineering materials subjects of interest to the particular district help in "promoting knowledge of materials." Finally the meetings provide members an opportunity to bring their friends and business associates who are interested in fields where A.S.T.M. is active and in this way help to widen appreciation of the Society's work.

This last objective is extremely important for if the rapidly growing A.S.T.M. work in standardization and research is to achieve anywhere near the success it deserves, it will be only by constant striving to promote a realization of its value. In short, while we have a "production" problem, we also have a "distribution" or "sales" problem. We must strive to insure that the results of A.S.T.M. committee and other work are put to maximum use. A.S.T.M. standard specifications and tests can be used more widely. The vast fund of technical data in A.S.T.M. publications is of help in many ways. Its use can be stimulated.

Finally, we must strive to build up the membership to help achieve these ends.

The activities of the District Committees, including the local meetings, will assist greatly in helping to solve these problems. The district committee officers and members merit the support of each A.S.T.M. member in the respective districts.

Notes on Society Finances

Following are some pertinent abstracts from the Secretary-Treasurer's report to the Executive Committee in January on 1934 finances and a word or two on the budget for 1935 activities.

Total receipts for 1934 were $116,808, made up of $67,467 from dues and entrance fees, $40,745 from sales of publications and $8596 from advertising, interest and miscellaneous sources. This is the first year since 1929 that receipts from dues and entrance fees have increased over the preceding year. Receipts from sales of publications, which include the large volume of sales of the Book of Standards that always come in the year following its publication, were the largest in our history—a direct reflection of the value of the Society's work to industry, and a very inspiring achievement in the face of industrial conditions during 1934. The policy of issuing special reprints, including compilations of standards relating to specific fields, has been more than justified by the increasing demand, which effects wider distribution of our specifications and methods and at the same time provides a source of income that has helped to offset the reduced income from membership dues. Without this source of income, the Society could not have continued its work without essential curtailment.

Total disbursements for 1934, with all current bills paid, were $112,717, leaving a favorable balance of $4091. In line with the executive policy that has been followed since membership losses began, this balance has been set aside with similar balances from previous years for emergency use.

There is shown on the facing page an interesting chart showing itemized receipts and disbursements per member, obtained by dividing totals for the several items by the number of members on December 31, 1934. Whereas total receipts averaged $33.45 per member, the average dues per member were $18.81. Income from sales of publications, which averaged $11.67 per member, is seen in its true proportion as a vital factor in support of the Society's operations. Disbursements are classified into four groups, as follows, showing the disbursement per member for each group:

I.	Standardization, Development and Promulgation	$12.04
II.	Advancement of Knowledge of Materials	6.98
III.	Promotional Work	2.29
IV.	Administrative Work	10.97
		$32.28

These figures tell an interesting story of the relative cost of the several lines of work of the Society.

Budgeting for 1935

It is still necessary to budget Society activities on a very conservative basis in view of present uncertainties. Current receipts are based upon a slight gain in membership, which seems reasonably assured this year. On the other hand, income from publications sales will normally be less than for 1934. Total receipts are estimated at $109,500. Expenditures as budgeted will be reviewed quarterly and adjusted within actual income, supplemented if need be by such reserve funds as may be safely and properly used. Full provision has been made for publication of new and revised standards. Some curtailment is still necessary respecting preprinting and publication of technical papers, and to some extent of committee reports.

Indications for the first quarter of 1935 are generally favorable for the Society. There is a distinctly stronger "tone" in the membership picture and sales of publications are continuing in unabated volume—a good barometer, we think, of industrial improvement.

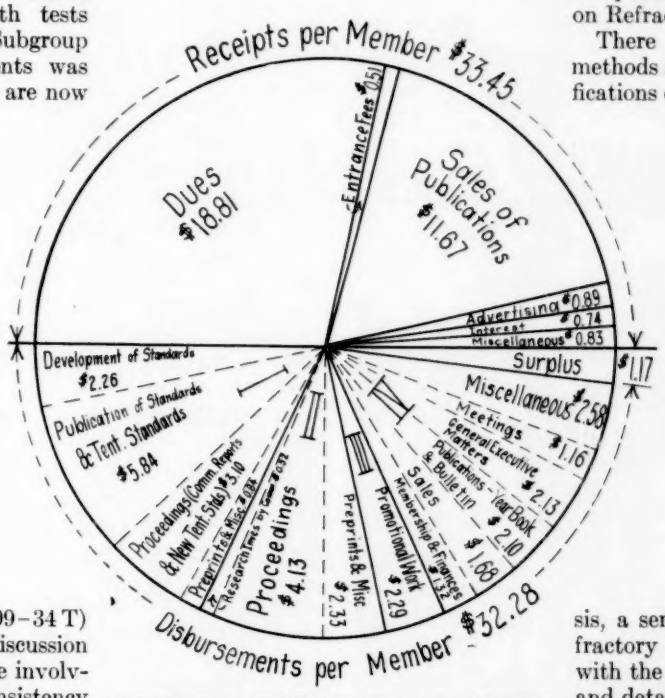
New York Meeting of Cement Committee

The recent meeting of Committee C-1 on Cement held in New York just prior to the annual convention of the American Concrete Institute was very well attended. Practically all of the subcommittees presented progress reports of the work in their jurisdiction. The extensive series of comparative strength tests under the sponsorship of the Subgroup on High-Early-Strength Cements was described. Several laboratories are now testing a large number of these cements and some of the current results were described.

Spirited discussion took place on the existing Tentative Specifications for High-Early-Strength Portland Cement (C 74 – 30 T) and as a result the committee is now conducting a letter ballot on the recommendation to adopt these as standard with one change, namely, the omission of all reference to fineness.

Questions which have arisen in connection with the Tentative Method of Test for Compressive Strength of Portland Cement Mortars (C 109 – 34 T) were reviewed and there was discussion of the work in progress on these involving rate of loading, normal consistency and the size gradation of the sands.

The Working Committee on Volume Change and Soundness discussed the current work, in which there is now being tested in pastes and mortars the cements being studied by the High-Early-Strength Committee, and also twenty commercial cements and thirty cements especially prepared in the P.C.A. Fellowship at the National Bureau of Standards. It is hoped that a progress report on this work will be ready by June.



1934 Receipts and Disbursements per Member

1935 Nominating Committee for Officers

Based on the report of the tellers, W. P. Scanlin, Chief Engineer, Philadelphia Rapid Transit Co., and J. E. Brewer, Consulting Chemist, Brewer & Gardner, both of Philadelphia, on the ballot on recommendations for appointments on the 1935 Nominating Committee, the Executive Committee appointed the following members of the Society to serve:

Members	*Alternates*
G. H. Woodroffe	R. H. Irons
Louis Anderson	M. A. Swayze
Sabin Crocker	T. A. Boyd
Dean Harvey	T. S. Fuller
P. H. Bates	H. L. Curtis
R. L. Templin	G. H. Clamer

These members, together with Past-Presidents F. O. Clements, Cloyd M. Chapman and T. R. Lawson, who according to the By-laws are *ex-officio* members of the Nominating Committee, have selected nominees for President, Vice-President, and for five members of the Executive Committee, whose terms expire with the June, 1935, meeting. The nominees will be announced in the April BULLETIN. At the Nominating Committee meeting, Mr. Swayze was present in place of Mr. Anderson.

Publication on Refractory Materials

The Society has recently issued a compilation of all A.S.T.M. standards on refractory materials, together with the Manual on Interpretation of Refractory Test Data and other important related information. This publication was compiled by A.S.T.M. Committee C-8 on Refractories.

There are 21 specifications, test methods and definitions included. Specifications cover clay fire brick for several uses, refractories for construction of incinerators and ground fire clay. Methods of test include porosity and volume change, permanent linear change, softening point, chemical analysis, particle size of ground materials and others.

The Manual on Interpretation of Refractory Test Data, first issued in 1932, has been extensively revised and simplified and should be of considerable assistance to those investigating and reporting properties of these materials. To help maintain accuracy in chemical analysis, a series of standard samples of refractory materials has been developed with the National Bureau of Standards and detailed tables in the book give the composition of the eight samples which may be obtained from the Bureau in Washington.

In order that the committee might have adequate information on conditions under which refractories were used a number of comprehensive surveys were made of outstanding consuming industries covering open-hearth practice, malleable iron industry, copper and lead industries and by-product coke ovens. These comprehensive reports are given in the publication.

The 1935 edition comprises 143 pages as compared with 93 in the first edition. The special price to members is 75 cents per copy with reductions on orders for ten or more copies.

Report Available on Concrete Tests

The Report on Significance of Tests of Concrete and Concrete Aggregates prepared by Committee C-9 is now available and members who have requested the copy to which they are entitled by virtue of their membership should receive it shortly. In view of the importance of this publication which evaluates the various tests, it is thought that a number of the members may wish to procure additional copies and as a convenience an order blank is enclosed. The special price to members is $1 with reductions on orders for ten or more.

Discussion of Paint Symposium

Members of the Society and others who wish to present written discussion in connection with the fifteen papers comprising the Symposium on Paint and Paint Materials held as part of the recent Philadelphia Regional Meeting (see page 3) are requested to submit such discussion as soon as possible. Discussion will be received until April 22.

Review of Committee Week

(*Continued from page 5*)

revised tables will continue to carry theoretical weights as heretofore. Clarification of marking requirements in this same specification was approved.

Specification requirements are to be drafted covering electric-resistance welded boiler tubing. It is anticipated this specification will be presented in June.

A combined meeting of subcommittees on chemical analysis, of several of the A.S.T.M. committees dealing with ferrous metals, resulted in the approval of the formation of a new standing committee to cover chemical analysis of metals. Extensive proposed revisions in the chemical determination of carbon, manganese, copper, sulfur and silicon were reviewed and submission of these to the Society is anticipated shortly as soon as minor items can be worked up. This work anticipates the consolidation of A.S.T.M. methods of analysis of ferrous metals in a single specification.

Important revisions in the Standard Specifications for Commercial Quality Hot-Rolled Bar Steels (A 107 – 33) and Commercial Cold-Finished Bar Steels and Cold-Finished Shafting (A 108 – 33) involve the revision of S.A.E. grades and the classification of flat hot-rolled steel. The recommendations provide for the adoption of carbon steel and free cutting steel compositions soon to be announced by the S.A.E., with the retention of S.A.E. grade numbers as a measure of cooperation with this society.

The subcommittee on steel for welding recommended that the specifications for high tensile strength carbon-steel plates, A 149 and A 150, be included in the list of steels suitable for welding. A preliminary study of the effect of carbon and manganese content on weldability showed the need for an extensive test program which it is hoped may be inaugurated shortly.

In the field of high-temperature service proposed specifications covering nuts, bolts and forgings for service at temperatures from 750 to 1100 F. had been drafted but as a result of the meetings a number of changes are to be incorporated. It is anticipated that these may be ready for publication as tentative this year. The subgroup which developed high-temperature data has collected from many sources extensive creep data and the report of this group will be presented shortly to Subcommittee XXII.

Committee A-2 on Wrought Iron.—This committee has completed the preparation of two new specifications for wrought-iron sheets covering black and galvanized sheet materials, respectively. These have been approved by letter ballot of the committee for submission to the Society for publication as tentative. The requirements for zinc coating in the galvanized sheet specifications are receiving the attention of Committee A-5 on Corrosion of Iron and Steel.

The committee has undertaken the preparation of new specifications for single refined wrought-iron bars which will cover material made solely from new iron exclusive of scrap. The existing Standard Specifications for Refined Wrought-Iron Bars (A 41 – 30) permit the use of purchased scrap and it is planned to modify these specifications since a separate specification will be prepared for bars of single refined wrought iron.

The committee gave consideration to several comments received from the A.S.M.E. Boiler Code Committee involving the Tentative Specifications for Wrought-Iron Rivets and Rivet Rounds (A 152 – 33 T). The present specifications do not provide elongation requirements for rivet rounds under ½ in. in diameter. The committee is endeavoring to obtain the necessary data as a basis for providing ductility requirements for these smaller sizes of rivet material. Consideration is also being given to the inclusion in the specifications of bend test requirements for the shank of the finished wrought-iron rivet. It is expected that the necessary information will be obtained in the near future in order that the revisions may be made in the specifications.

No adverse criticisms have been received by the committee of the tentative revision issued last year of the Standard Specifications for Hollow Rolled Staybolt Iron (A 86 – 30). This provides permissible variations in the size of hole and its location. This revision is to be recommended for adoption as standard.

The committee's attention was called to a number of important revisions which have been made by the Association of American Railroads in their specifications for wrought-iron pipe, bars, blooms, and chain. Considerable interest was expressed in these revisions since Committee A-2 is responsible for a number of specifications for similar materials. The changes proposed by the A.A.R. were accordingly referred to the appropriate A-2 subcommittee for review and consideration in order to bring about the desired harmony between the specifications of the A.S.T.M. and those of the A.A.R.

Committee A-3 on Cast Iron.—Revisions are to be recommended by Committee A-3 in the Tentative Specifications for Gray-Iron Castings (A 48 – 32 T). The separately cast tensile bar will be eliminated from the specifications since tests have shown that tensile bars cut from the transverse test bars are satisfactory. The transverse test values will be revised. Certain necessary revisions are contemplated in the existing Tentative Specifications for Cast-Iron Culvert Pipe (A 142 – 34 T).

A proposed tentative specification for automotive gray-iron castings has been developed in cooperation with the Iron and Steel Division of the Society of Automotive Engineers.

Considerable work on tests of car wheels has been carried on by the subcommittee on this subject and studies have been made of specification requirements. It is anticipated that this work will result next year in a revised standard.

Committee A-5 on Corrosion of Iron and Steel.—Committee A-5 took action to recommend the withdrawal of the Tentative Specifications for Zinc-Coated (Galvanized) Iron or Steel Farm-Field and Railroad Right-of-Way Wire Fencing (A 116 – 32 T) and Tentative Specifications for Zinc-Coated (Galvanized) Iron or Steel Barbed Wire (A 121 – 32 T). At the same time the Standard Specifications A 116 and A 121 are to be revised editorially to clarify requirements for weight and uniformity of coating. These revisions will correspond to sections in the tentative specifications being withdrawn.

Since the adoption as standard of the Standard Methods of Determining Weight and Uniformity of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles (A 90 – 33) has made obsolete the Standard Methods of Testing Zinc-Coated (Galvanized) Iron and Steel Wire and Wire Products (A 110 – 30) the latter are to be recommended for withdrawal.

Action was taken to recommend the adoption as standard of the existing Tentative Recommended Practice for Safeguarding Against Embrittlement of Hot-Galvanized Structural Steel Products and Procedure for Detecting Embrittlement (A 143 – 32 T).

The proposed specifications covering electrodeposited coatings of zinc, cadmium, nickel and chromium on steel were referred to the committee for consideration and it is expected that they may be issued this year as tentative. These were developed as a joint effort of the American Electro-Platers' Society and the A.S.T.M.

A critical review of the Preece Test for determining the uniformity of zinc coating on wire has been completed by the subcommittee on methods of testing. It is planned to publish this method as a draft standard as soon as the subcommittee can complete the necessary arrangements. Further work on the use of this test on irregularly shaped articles, such as hardware, is actively under way. The subcommittee is also making a critical review of test methods for determining the weight or thickness of electrodeposited coatings and for determining the weight of zinc coatings on coated hardware.

Inspection data on additional failures of the field tests of bare and coated sheets and hardware will be reported this year in substantially the same form as before. The wire test program is going actively forward. Additional funds to insure the carrying out of these tests are now being solicited.

Committee A-10 on Iron-Chromium, Iron-Chromium-Nickel and Related Alloys.—The development of the so-called "stainless" steels, which presented numerous problems and handicaps, has been among the outstanding metallurgical accomplishments of recent years. As the result of the wide application of these stainless metals, there has been an increasing need for standard specifications and tests. This matter has been the subject of considerable study by Committee A-10 and at its meeting considerable progress was reported in the formulation of purchase specifications for the chromium- and nickel-bearing steels within the scope of the committee. The committee expects to be able to present to the Society in June five new specifications which will cover the annealed corrosion-resistant sheet steels, both plain chromium and chromium-nickel steels and also for cold-rolled chromium-nickel steel. Drafts of the specifications were considered in detail by the subcommittee on specifications for flat products, and a number of improvements and changes were agreed upon before they were presented to the main committee. These specifications will be the first for these materials prepared by the committee and represent a significant trend in its work.

The subcommittee on specifications for castings reported on the preparation of three new specifications for plain chromium-steel castings which were presented to Committee A-10 for presentation to the Society for publication as tentative. This subcommittee also reported that six additional specifications for steels containing chromium and nickel were well under way.

The subcommittee on mechanical tests has prepared an extensive program for testing both annealed and cold-drawn nickel-chromium steel, especially the 18 per cent chromium, 8 per cent nickel types with a view to determining the applicability of the existing A.S.T.M. standard methods. The committee is planning to undertake a cooperative test program to study methods of mechanical testing and their use for these types of steels.

The subcommittee on corrosion testing has been giving consideration to the possibility of undertaking atmospheric exposure tests of metals in the field of Committee A-10 work. These would be carried on simultaneously with laboratory tests using procedures developed, or being studied, by the subcommittee. The program also comprises work to improve the test methods previously studied by the subcommittee which included the salt spray test, the boiling nitric acid test and the copper sulfate stain test.

Committee B-1 on Copper Wire.—Important revisions in the Standard Specifications for Bare Concentric-Lay Copper Cable, Medium, Hard or Soft (B 8 – 27) which will provide new requirements for testing this type of copper cable are to be referred to committee letter ballot. The changes provide for the testing of the cable in its completed form; the present specifications require tests of the individual wires comprising the cable before but not after stranding.

A new stranding table for the cable is to be inserted in the specifications. This stranding table seems to have met the approval not only of Committee B-1, but also the Insulated Power Cable Engineers Association and the Sectional Committee on Insulated Wires and Cables.

The committee received an interesting report of progress from its subcommittee on electrical transmission wire and cable specifications. This report included data resulting from a number of tests on transmission cable for the purpose of investigating the question of soft *versus* hard wire core in such cables.

Action was taken to propose tentative additions to the bronze trolley wire specifications to provide requirements covering a higher conductivity trolley wire than the present two classifications. The committee also proposed tentative revisions providing for additional limitations of certain dimensions of grooved trolley wire, both bronze and copper.

Committee B-2 on Non-Ferrous Metals and Alloys.—After discussing a number of phases of the work in its charge, Committee B-2 gave consideration to the status of the proposed specifications for lead-coated copper sheets which were published for information in the January BULLETIN. The subcommittee in charge recommended that these specifications be submitted to the Society for approval as tentative standard and this recommendation was confirmed by the main committee. The specifications cover lead-coated sheet copper for architectural uses, which is supplied in two types according to the method of manufacture and in three grades according to the weight of coating.

Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys.—Interesting reports were presented by the subcommittees charged with the responsibility of planning and carrying out the extensive corrosion tests on non-ferrous metals, including the atmospheric corrosion studies at nine locations in the United States, the immersion tests in different liquids and the studies of galvanic and electrolytic corrosion.

Plans were completed for displaying corroded specimens at the A.S.T.M. Exhibit in Detroit, next June. There will be available at that time a series of atmospheric specimens which has been exposed over a period of one year, and another series which has been exposed for three years. Meteorological data have been carefully kept at the test locations and the weight loss and strength loss of the specimens have been considered in the light of such data.

There will also be available specimens immersed for various lengths of time in sulfuric acid pickle tanks, and an extensive series of galvanic couples exposed to the atmosphere at nine test locations in various parts of the country. The committee feels that these displays will prove to be both interesting and instructive to a large number of engineers and technologists.

Committee B-5 on Copper and Copper Alloys.—Committee B-5 has made excellent progress during the year in its extensive standardization work and at this meeting three new tentative specifications were received from its subcommittee on wrought metals and alloys. It is anticipated that these may become 1935 tentative standards. The specifications cover wrought phosphor-bronze bearings and expansion plates for bridges and structures, and silicon-bronze bearings and expansion plates for the same purpose. The third specification will provide standardized requirements for copper-silicon alloy wire for general purposes.

It will be recalled that this committee prepared last year three specifications for copper-silicon alloys, covering, respectively, sheet, plates, rods, bars and shapes.

Research Committee on Fatigue of Metals.—A progress report was given on the cooperative study with the Subcommittee on X-ray Methods of Committee E-4 on Metallography on the effect of fatigue damage in metals on the indications given by X-ray crystal analysis. So far the results indicate that in some metals the X-ray spectrogram may indicate the effect of cold work, but that no clear evidence has been seen in the X-ray spectrogram of the starting of fatigue cracks. The investigation is to be continued.

The committee voted to prepare a set of notes on the technique of making fatigue tests on rotating-beam testing machines (including machines of the cantilever type). A tentative draft of such notes was discussed, revised, and is to be submitted to letter ballot of the committee.

A problem of the fatigue strength of steel-core copper-coated wires (copperweld) was presented, and suggestions made for the investigation of the problem, which is of interest in connection with the mechanical strength of electric transmission lines.

Experiments on determining the damage done to metal by occasional heavy overstress were reported, following the "damage line" method of H. J. French. This method of investigation gives promise of usefulness in the very important problem of determining how sensitive a metal is to damage under occasional overload. This is, perhaps, fully as important as the problem of the strength of a metal under ordinary working stresses.

Metallography.—Revised recommended practices for preparing and examining specimens were carefully considered by the subcommittee on selection and preparation of samples for metallographic testing of Committee E-4. The committee intends that these methods of procedure will replace obsolete ones now in existence since they are designed to present in convenient and condensed form practices successfully used for both ferrous and non-ferrous metals and alloys. The committee took action to recommend the publication as tentative of the methods.

The first section of the proposed standard covers selecting, mounting and cleaning of samples. This is followed by discussion of recommended procedures for examination of various metals and their alloys, including aluminum, copper, iron and steel, lead, magnesium, nickel, precious metals, tin, zinc, and finally recommendations covering microscopy and photography. An extensive bibliography covering important articles and references to the subject of metallographic testing is included as an appendix to the methods.

In the sections covering the various alloys the preparation of specimens is described, tables of etching solutions involving the reagent composition, method of use and application are given, followed by discussion of examination and identification of constituents. The committee has expended a great deal of effort and time in the preparation of these methods and when published they should be a ready reference for metallurgical laboratories.

Properties of Metals at Low Temperatures.—A new Subcommittee on Properties of Metals at Low Temperatures was organized during Committee Week. This is to be a subcommittee of the Joint Research Committee of the A.S.M.E. and A.S.T.M. on Effect of Temperature on the Properties of Metals.

For the purpose of its work, the committee has defined low temperatures as any below room temperature, that is, 70 F. This subject is of great interest to many branches of industry, because of the subnormal temperatures at which equipment must work, such as railroad equipment in northern climates, airplanes flying at high altitudes, in the liquefaction of gases, dewaxing of oils, etc.

The committee will send out immediately a questionnaire to elicit information on what test and research work has been done, the type and nature of such tests with results and also what particular phases of the problem are of most immediate interest to industry.

A bibliography is to be prepared and a general program of work will be presented for the consideration of the joint committee at its next session.

Specifications for Electroplated Coatings.—The work which has been going on for the past three years under the direction of the American Society for Testing Materials, the American Electro-Platers' Society and the National Bureau of Standards has reached the state where specifications on the plated coatings on iron and steel are ready for approval. About 7000 panels were exposed in corrosion tests, plated in almost every way known to the plating industry and some very important facts were discovered. It was found that the plating usually used was considerably less in thickness than should be required in accordance with the findings of the test.

At the meeting of the committee further progress was made in completing the specifications. Their adoption by industry is a very important matter involving the use of greatly increased materials used in plating, such as nickel, copper, zinc and cadmium. Due to increased quality which will result from conformity with the requirements, the use of plated products will probably be increased.

It is expected that the three specifications will be issued shortly (see page —, Committee A-5). These cover the following: Electrodeposited coatings of nickel and chromium on steel, electrodeposits of zinc on steel, electrodeposits of cadmium on steel. In each of the specifications two types of coating are covered, namely, coating for general service and coating for mild service. The requirements involve manufacture, thickness of deposits and, in the case of nickel and chromium coatings on steel, a continuity test is specified. Methods for thickness measurement are of course given in each of the three specifications.

Appendices to the items give important supplementary information on time required for plating and explanation of symbols used as designations of the grades of plating.

Zinc Coating of Iron and Steel.—The Sectional Committee on Specifications for Zinc Coating of Iron and Steel, sponsored by A.S.T.M., functions under the procedure of the American Standards Association for the purpose of considering national uniform specifications for the adequate protective coating of different classes of zinc-coated products for approval as American Standard. The committee gave consideration to

several existing specifications for zinc-coated materials and approved for submission to letter ballot of its membership the following A.S.T.M. specifications which, if approved, will be submitted to the A.S.A. for approval as American Tentative Standards:

Zinc-Coated (Galvanized) Iron or Steel Telephone and Telegraph Line Wire (A 111 – 33)
Zinc-Coated (Galvanized) Iron or Steel Tie Wires (A 112 – 33)
Zinc-Coated Iron or Steel Chain-Link Fence Fabric Galvanized After Weaving (A 117 – 33)
Zinc-Coated (Galvanized) Iron or Steel Wire Strand (Cable) (A 122 – 33)
Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses (A 120 – 34 T)

The first four standard specifications cover various types of galvanized wire and wire products and were prepared by the A.S.T.M. Committee A-5 on Corrosion of Iron and Steel. The tentative specifications for steel pipe, which cover pipe for ordinary uses such as low-pressure service in steam, water and gas lines, were developed by the A.S.T.M. Committee A-1 on Steel. The galvanizing requirements of these specifications were prepared in cooperation with Committee A-5 and the sectional committee.

Testing Thin Sheet Metals.—With the increasing use of thinner sheet metals questions of proper methods of determining their physical characteristics and the significance of such tests have become increasingly important. These problems have for several years been receiving the attention of the Subcommittee on Testing Thin Sheet Metals, of Committee E-1 on Methods of Testing. This committee has studied methods of hardness testing of very thin sheet metals and is obtaining information on the scope and usefulness of the various mechanical tests.

The indentation hardness studies have resulted in recommendations respecting details of procedure in determining the Rockwell hardness of thin sheet metallic materials and these were approved for submission to the E-1 Subcommittee on Indentation Hardness for inclusion in the existing Tentative Methods of Rockwell Hardness Testing of Metallic Materials (E 18 – 33 T).

In order to encourage the informal presentation of information concerning the practical utilization of tests applied to metals in sheet form, a questionnaire has been sent to a large number of laboratories, manufacturers and users interested in these materials. The information thus far obtained indicates that various tests, including tension, several types of indentation hardness, cold bend, cupping, fatigue, shear or punching, impact, metallographic, creep, corrosion, embrittlement, etc., are being used. The data resulting from this questionnaire will be invaluable to the committee in formulating standards for the testing of thin sheet metals. It is expected the information obtained may be presented at the annual meeting in Detroit, in June.

The committee is planning for a round table discussion of ductility testing of sheet metals which is also to be held during the annual meeting. This will involve largely the so-called "cupping tests" and this work will be carried on in cooperation with the E-1 Subcommittee on Bend Testing.

Committee C-3 on Brick.—The subcommittee on weathering and porosity submitted a very interesting report on weathering of brick. The report included two technical papers by members of the committee describing studies that have been conducted and which proved very valuable in connection with the activities of the committee. This work has resulted in the development of a method by which the weather resistance of fire-clay bodies, such as brick in a wall, may be measured by definite tests. The proposed procedure was approved for submission to letter ballot for inclusion in the new methods of testing brick which are to be issued during the year.

The committee approved revisions for publication as tentative of the existing Standard Specifications for Building Brick (Made from Clay or Shale) (C 62 – 30) which will include provisions for weathering resistance in accordance with the new test method.

The subcommittee on methods of testing reported on a thorough study of the Standard Methods of Testing Brick (Compression, Flexure, Absorption) (C 67 – 31), which has resulted in a number of proposed changes in form and arrangement. The revised methods are to be presented for publication as tentative as a revision of the existing standard methods and will include the newly developed weathering test procedure.

The committee will undertake studies to determine the effect of de-airing on the physical properties of brick which when completed may result in improvements and changes in the specifications for paving brick. A study will also be made of the specifications for sewer brick and it is anticipated that these will result in improvements which may be ready for consideration at the next meeting of the committee.

Committee C-4 on Clay Pipe.—The committee gave considerable attention to amendments in the existing Tentative Specifications for Clay Sewer Pipe (C 13 – 33 T) and approved a number of modifications in the specifications which were ordered submitted to the entire committee in the form of a letter ballot before referring them to the Society. The committee also decided to recommend to the Society that these specifications in their amended form be referred to the Society for adoption as standard.

A subcommittee was appointed to conduct investigational work on the placing of the bearing strips in the three-edge-bearing method with respect to the ultimate strength of clay sewer pipe. This subcommittee is to work in collaboration with a committee appointed last June consisting of manufacturers and others interested in this problem on the Pacific Coast.

The committee also considered revisions of the definitions relating to sewer pipe which will be submitted to the Society as a revision of the existing Standard Definitions of Terms Relating to Sewer Pipe (C 8).

Committee C-10 on Masonry Building Units.—After considering and taking action on a number of matters in connection with certain of the specifications in its charge, Committee C-10 decided to arrange a round-table discussion of the structural clay tile specifications, in Washington on March 20. Many of the government construction agencies are using new federal specifications which are in close accordance with the A.S.T.M. requirements. Certain differences existing in the various specifications tend to create confusion and hardship in certain instances and the committee believes it quite appropriate that representatives of the various federal agencies be invited to send representatives to the meeting.

A number of revisions were approved in the committee specifications subject to letter ballot approval of the entire group. In the Tentative Specifications for Structural Clay Load-Bearing Wall Tile (C 34 – 34 T) it was recommended that in the section dealing with weights and number of cells the following change be made:

"The area of bonding tile shall be calculated on the basis of the mean height of the two vertical faces as laid in the wall."

A further revision will provide that "tile shall not be rejected for overweight unless the tile shall be used in skeleton frame construction."

In these same specifications a revision is to be inserted to call attention to the fact that the weights given in the weight tables are for scored tile. This change will provide that if any of the faces are smooth the values shall be increased 1 lb. per sq. ft. of smooth area. A corresponding change is to be made in the Tentative Specifications for Structural Clay Non-Load-Bearing Tile (C 56 – 34 T) and Tentative Specifications for Structural Clay Floor Tile (C 57 – 34 T), but with the provision that the values given in the tables will be increased ½ lb. per sq. ft. of smooth area if any faces are smooth.

In order to clarify the scope of the specifications mentioned above, the committee will ballot on the following paragraph:

"They cover physical requirements only. If a purchaser desires tile having a particular color, texture, or finish, such features should be covered by a separate specification."

Preservative Coatings.—Several subcommittees of Committee D-1 on Preservative Coatings met during Committee Week. The Subcommittee on Pigments has prepared a new proposed specification for basic sulfate blue lead and it is anticipated this will be submitted to the Society for publication as tentative. Specification requirements also are being studied for raw and burnt siennas and umbers. Combined with this study is a consideration of the present Standard Specifications for Ocher (D 85 – 27) which involves similar problems.

During the past few years the situation with respect to lithopone has become much more elaborate. This pigment originally consisted of a coprecipitated mixture of zinc sulfide and barium sulfate made in molecular proportions. There are now "high strength lithopones" containing much more zinc sulfide than corresponds to molecular proportions. Pigments designated commercially as lithopone, but with other inerts than coprecipitated barium sulfate are being made. These include coprecipitated calcium sulfate, also mechanical mixtures of previously prepared barium sulfate, or calcium sulfate or in some cases such as inert as asbestine. Finally, zinc sulfide alone of commercial purity is used. All of these are to be given fundamental and thorough study with reference to proper classification, nomenclature and to suitable specifications for each class.

The subcommittee is considering also the desirability of changes in certain details of the Standard Specifications for Basic Sulfate White Lead (D 82 – 24) and in the Specifications for Leaded Zinc Oxide (D 80 – 24).

The Subcommittee on Accelerated Tests of Preservative Coatings reported progress in its work. Groups are organized to study tests for different types of protective coatings as follows: house paints, enamels, varnishes, lacquers, specifications for test exposure panels, metal protective paints.

Active cooperative programs are under way to check different laboratory test cycles against one another and against outdoor exposure tests in different parts of the country. The object is to find what laboratory test cycle is best for testing each type of protective coatings; also, to reach agreement as to a scheme for denoting and estimating the importance of different kinds of failures that appear in service. The interest is great because outdoor testing is difficult to control, whereas tests that can be made in the laboratory under controlled and reproducible accelerated conditions are necessary if protective coatings are ever to be specified on a weathering performance basis. Accelerated weathering tests have been developed by individual laboratories that are proving of value as aids in research and development work. One of the questions to be determined is whether these can be put on a basis that will make them useful for specification purposes.

Committee D-2 on Petroleum Products and Lubricants.—Interesting discussions of a number of phases of its work took place at the meeting of Committee D-2. The activities of the American Petroleum Institute Committee on Viscosity Standards in the standardization of Saybolt viscosimeter tubes has emphasized the necessity of amplifying and clarifying the text of the Standard Methods of Test for Viscosity of Petroleum Products and Lubricants (D 88 – 33). A report of the subcommittee on viscosity, which recommended such revisions, was accepted subject to minor changes.

The subcommittee on natural gasoline submitted a revision of the Tentative Methods of Test for Vapor Pressure of Natural Gasoline (Reid Method) (D 323 – 32 T). The revision (vapor pressure of motor and natural gasoline) increases the scope and accuracy of the methods. The report of the subcommittee was accepted.

The report of the A.P.I. Committee on Temperature Measurement was assigned to Subcommittee XV on Sampling and Gaging.

Committee D-4 on Road and Paving Materials.—A progress report from the recently organized subcommittee on soil testing methods was received. This group is studying the present tests used for evaluating soils for highway construction looking toward the development of standard testing procedures. The subcommittees on specifications and tests for emulsified asphalts also reported that they are reviewing the specifications covering five different types of asphalts and the complete compilation of testing procedures which were issued last year as tentative.

The committee considered a report from the Conference Committee on Silt and Loam representing Committee D-4 and Committee C-9 on Concrete and Concrete Aggregates on a review of the decantation test methods developed some years ago by Committees D-4 and C-9. A new test procedure for determining in aggregates the total quantity of material finer than a standard No. 200 sieve which had been prepared by the conference committee was accepted by Committee D-4 for submission to letter ballot and if approved will be submitted to the Society for publication as tentative.

The committee also approved certain proposed improvements in the Tentative Method of Test for Residue of Specified Penetration (D 243 – 32 T) which were accepted for submission to committee letter ballot.

The Subcommittee on Standard Coefficient of Expansion for Bituminous Products recommended that groups 0 and 1 of the Standard Volume Correction Table (D 206 – 34) be approved as applying to asphalt materials, similar action being taken by Committee D-8 on Bituminous Waterproofing and Roofing Materials.

Committee D-5 on Coal and Coke.—The following methods of test were approved for presentation to the Society next June as tentative, subject to the usual letter ballot vote of the committee:

Test for Screen Analysis of Coal
Test for Grindability of Coal by Hardgrove-Machine Method
Test for Grindability of Coal by Ball-Mill Method

The method for screen analysis of coal covers size testing of coal. It includes specifications for testing screens, sampling

procedure, and procedure for making the screen analysis. It applies to all coal with the exception of anthracite, powdered coal, and crushed coal as charged into coke ovens, for which methods of size testing have been already standardized by the Society.

The two methods for the determination of coal grindability measure the pulverizing characteristics of coal in connection with the commercial pulverization of coal for powdered coal plants. These two methods were selected by the committee after a thorough investigation by a number of cooperating laboratories of various methods that have been proposed for this test. The Hardgrove-machine method has the advantage of speed in testing; the ball-mill method requires somewhat more time but has the advantage of low cost of equipment. The results by either method can be readily converted into those of the other method.

The committee voted to recommend the adoption as standard of the present Tentative Method of Sampling Coke for Analysis (D 346 – 33 T). Gratifying progress was reported in the development of methods of test for determination of friability of coal, that is, the resistance to breakage of coal on handling. It is probable that tentative methods for this test will be presented at the June meeting of Committee D-5 in Detroit.

Committee D-8 on Bituminous Waterproofing and Roofing Materials.—On the recommendation of the subcommittee responsible for the preparation of specifications and analytical methods for membrane materials, Committee D-8 approved for submission to letter ballot revisions in standard and tentative specifications and test methods covering the following:

Woven Cotton Fabrics Saturated with Bituminous Substances (D 173 – 27)
Asphalt Roofing Surfaced with Powdered Talc or Mica (D 224 – 34 T)
Asphalt Shingles Surfaced with Coarse Mineral Granules (D 225 – 34 T)
Asphalt Roofing Surfaced with Fine Mineral Granules (D 248 – 34 T)
Asphalt Roofing Surfaced with Coarse Mineral Granules (D 249 – 34 T)
Asphalt for Use in Constructing Built-Up Roof Coverings (D 312 – 29 T)
Test for Coarse Particles in Bituminous Materials by Means of Elutriation (D 313 – 29 T).

The committee received a progress report on further studies made at the National Bureau of Standards on accelerated weathering tests of bituminous materials which are under the jurisdiction of Subcommittee VIII. These cooperative studies have been under way for about five years. In 1933 the committee formulated a proposed procedure which was published as information. Recent studies have been concerned with comparisons of results of exposure tests of bituminous mixtures as roofing coatings by the weatherometer method and also outdoor exposure.

As indicated above (see Committee D-4) concurrent action was taken to recommend the approval of groups 0 and 1 of the Standard Volume Correction Table (D 206 – 34) as applying to asphalt materials.

Committee D-11 on Rubber Products.—The subcommittee working in the field of rubber products for absorbing vibration reported on the studies which it is making on the correlation and checking of the various methods of hardness testing. This subcommittee has completed a method for testing compression set of rubber under constant deflection which it is expected will be submitted in June for publication as tentative. The subcommittee on insulating tape is studying methods of accelerated aging tests for insulating tape and is carrying out a cooperative test program for the purpose of improving and correlating test methods for testing friction tape and rubber insulating tape.

The subcommittee on dynamic fatigue testing has developed four methods of dynamic fatigue testing which are applicable to testing tire carcasses and belts for ply separation and for flex cracking of vulcanized rubber. As a result of discussion at the D-11 meeting further work will be done on them.

Additional work was reported on accelerated aging tests for rubber products including the Geer oven and oxygen bomb aging tests. Testing of heat deterioration of rubber under elevated air pressures was discussed and it was decided to prepare standard procedures for tests of this type. It is expected these will be presented in the near future.

Development of reference standard rubber stocks in vulcanized form having certified physical properties which might serve as reference standards in abrasion and other tests was considered and a definite program was decided upon looking toward making such standard stocks commercially available.

A number of revisions in the Standard Methods of Physical Testing of Rubber Products (D 15 – 32) were considered and will be recommended to the Society in June for adoption. A suggested outline for a Laboratory Test Manual which would include the existing standard methods for rubber testing and also the methods now in process of development in the committee was approved.

The subcommittee on insulated wire and cable gave consideration to a number of editorial improvements and changes in substance in the existing specifications covering the several types of insulated wire and cable for which it is responsible and it is expected that these will be offered for approval in June.

Calibration of Testing Machines.—Testing machines to determine the strength of metals, wood, concrete, brick and other structural materials often must weigh loads of hundreds of thousands of pounds. Devices to verify the correctness of their readings present a difficult technical problem. Weights applied directly cannot be used for such large forces, and verifying apparatus must be portable,—carried to the machine and used there, since the machines, weighing scores of tons in many cases, cannot be moved. The subcommittee on calibration of testing machines, of Committee E-1 on Methods of Testing, reviewed the existing tentative standards for such devices, and recommended some slight modifications.

The device most commonly used consists of a bar or a ring of steel which is stretched, compressed or bent under the load applied by the machine, and the change of shape of the bar or ring is measured by a delicate micrometer. This instrument is itself standardized by loading with weights (up to 110,000 lb. if necessary) which are kept at the National Bureau of Standards. The committee gave special attention to the requirements of sensitivity for such devices.

Additions to the methods for verifying testing machines by means of standard levers and weights were considered, and attention was given to instruments for horizontal testing machines. A proposed method combining standard levers, standard weights and a compression or tension bar was submitted and investigations of this method are planned for the coming year.

New Members to March 15, 1935

The following 43 members were elected from January 30 to March 15, 1935:

Company Members (6)

BECKLEY TESTING LABORATORY, R. L. Davis, President, Box 415, Beckley, W. Va.

CONSOLIDATED EXPANDED METAL COS., THE, T. R. Herbest, Jr., President, Wheeling, W. Va.

FERROCARRIL DEL PACIFICO, DEPARTMENTO DE MATERIALES, A. Restrepo, Chief, Apartado de Correos No. 16, Cali, Colombia.

KILBY CAR AND FOUNDRY CO., O. M. Kilby, Vice-President, Anniston, Ala.

OWENS-ILLINOIS GLASS CO., U. E. Bowes, Director of Research, Alton, Ill.

R-B-H LACQUER BASE CO., W. S. Edgar, Vice-President and Technical Director, Bound Brook, N. J.

Individual and Other Members (34)

ARNOLD, G. F., Superintendent, The National Refining Co., Findlay, Ohio.

ATWOOD, F. CLARKE, Vice-President, Atlantic Research Associates, Inc., Boston, Mass. For mail: 68 Maple St., Newton, Mass.

BAKER, C. W., Chief Engineer, The Canadian Crocker-Wheeler Co., Ltd., St. Catharines, Ont., Canada.

BETTY, B. B., Special Research Assistant, Engineering Experiment Station, University of Illinois, 317 Materials Testing Laboratory, Urbana, Ill.

BURTON, H. H., Chief Metallurgist, English Steel Corp., Ltd., Vickers Works, Sheffield, England.

CHAPMAN, A. L., Material Inspector, Hygrade Sylvania Corp., Emporium, Pa.

CORBIN, M. H., Chief Chemist, In Charge of Research, The Arco Co., 7301 Bessemer Ave., Cleveland, Ohio.

DEACON, B. W., Sales Engineer, D. A. Stuart and Co., Chicago, Ill. For mail: 153 Pilgrim Ave., Highland Park, Mich.

DERBY, EARLE, Manager, Standard Gasoline Co., 225 Bush St., San Francisco, Calif.

DIDDEN, A., "Diadema Argentina," S. A. de Petroleo, Av. Roque Saenz Pena 615–8° piso, Buenos Aires, Argentina.

DUVALL, CHARLES S., Secretary, Maryland Bolt and Nut Co. Box 12, Mt. Washington, Baltimore, Md.

GRASSELL, P. W., President, Wilson Steel and Wire Co., 4840 S. Western Ave., Chicago, Ill.

JOVANOVITS, JOHANN, Director, Swiss Testing House, Notkerstrasse 20, St. Gallen, Switzerland.

KELLY, C. I., Chief Chemist, Herbert Green and Co., Ltd., Thames House, Millbank, London, S. W. 1, England.

KEMPF, L. W., Metallurgist, Aluminum Co. of America, 2210 Harvard Ave., Cleveland, Ohio.

KERINS, R. E., Superintendent of Car Equipment, Interborough Rapid Transit Co., 165 Broadway, New York City. For mail: 2545 Seventh Ave.

KNOPEL, HERBERT J., Consulting Engineer, 1700 Walnut St., Philadelphia, Pa.

LAKELAND, CITY OF, ENGINEERING DEPT., Lakeland, Fla.

MARTIN, L. C., Chief Inspector, Homestead Steel Works, Munhall, Pa.

METCALFE, KENNETH, Plant Metallurgist, Crucible Steel Co. of America, La Belle Works, Ridge and Reedsdale Sts., N. S., Pittsburgh, Pa.

MORRIS, A. T., General Manager, Highland Iron and Steel Co., Terre Haute, Ind.

MOULTON, M. V., Manager, Pipe Line Dept., Sunset Oil Co., 995 Pacific Electric Bldg., Los Angeles, Calif.

ROMIG, O. E., Special Representative, Electrical Sheets, American Sheet and Tin Plate Co., 1302 Frick Bldg., Pittsburgh, Pa.

RORDAM, S., Superintendent, Signal Mountain Portland Cement Co., Volunteer Bldg., Chattanooga, Tenn.

RUNDE, H. G., Inspector, Chance Vought Corp., East Hartford, Conn.

ST. JOHN, R. N., Director, United Laboratories, 240 N. St. Francis St., Wichita, Kans.

SHEPARD, R. B., Electrical Engineer, Underwriters Laboratories, 109 Leonard St., New York City.

SWEENEY, W. J., Director, Development and Research Laboratory, Standard Oil Co. of Louisiana, North Baton Rouge, La.

TOBY, E. M., JR., Manager, Naphtha Dept., American Mineral Spirits Co., 155 E. Forty-fourth St., New York City.

URIE, F. D., Superintendent of Research and Inspection, Elgin National Watch Co., Elgin, Ill.

VAUGHAN, M. C., Chemist, Pioneer Asphalt Co., Lawrenceville, Ill.

WELSH, T. W. B., Consulting and Analytical Chemist, 114 E. Thirty-second St., New York City.

WHITNEY, L. C., Chief Metallurgist, Copperweld Steel Co., Glassport, Pa.

WILLIAMS, G. T., Metallurgist, Cleveland Tractor Co., 19300 Euclid Ave., Cleveland, Ohio.

Personals

News Items concerning the activities of our members will be welcomed for inclusion in this column. Such news items are of very great interest to the membership at large and the number should be considerably augmented

FRANZ D. ABBOTT formerly with the Goodyear Tire and Rubber Co., Akron, Ohio, is now Technical Superintendent of the Ohio Rubber Co., Willoughby, Ohio.

EDWIN K. BORCHARD has been appointed Technical Manager by the Keystone Portland Cement Co. with offices in Philadelphia, New York and Boston. Mr. Borchard has been associated with the Universal Atlas Cement Co., as Technical Service Manager, and for many years with the Atlas Portland Cement Co. and the Portland Cement Assn. in technical and editorial work.

CHARLES PACK is now Plant Manager, Doehler Die Casting Co., Toledo, Ohio. Mr. Pack was formerly connected with Pack-Morin, Inc., New York City as Chemist and Metallurgist.

ALVAH R. SMALL, formerly Vice-President of Underwriters' Laboratories, is now President of that organization.

EDGAR C. BAIN has been made Assistant to Vice-President in Charge of Metallurgy and Research, U. S. Steel Corp., New York City. He was Metallurgist for the U. S. Steel Research Laboratory, Kearny, N. J.

JORDAN A. PUGH, who was District Manager for the Brick Manufacturers Association of America, Washington, D. C., is now the Washington Representative, Structural Clay Products, Inc., Washington.

ROBERT E. WILSON, formerly Vice-President, in Charge of Research and Development, Standard Oil Co. (Indiana), Chicago, Ill., is now Vice-Chairman of the Board, Pan American Petroleum and Transport Co., New York City.

E. F. CONE, was recently made Editor, *Metals & Alloys*, New York City.

J. S. G. PRIMROSE is now Chief Metallurgist, The Rover Motor Co., Ltd., Birmingham, England. He was formerly connected with The Whitecross Co., Ltd., as metallurgist.

CARL E. SWARTZ, formerly a member of the Technical Staff, Research Department of the American Smelting and Refining Co., was recently made Metallurgist, Cleveland Graphite Bronze Co., Cleveland, Ohio.

LEON S. MOISSEIFF, Consulting Engineer, New York City, was recently awarded the Norman Medal by the American Society of Civil Engineers for his paper on "George Washington Bridge—Design of the Towers."

ROGER C. GRIFFIN, Director of Tests, Arthur D. Little, Inc., has been elected Treasurer. Arthur D. Little, having retired as President, has been elected Chairman of the Board, being succeeded by Earl P. Stevenson who has been Vice-President since 1922.

R. E. DAVIS, Professor of Civil Engineering, G. E. TROXELL, Associate Professor, J. W. Kelly, Research Engineer, University of California, and R. W. CARLSON, Assistant Professor of Civil Engineering, Massachusetts Institute of Technology, have been awarded the Wason Medal for the most meritorious paper in the 1934 *Proceedings* of the American Concrete Institute. The title of their paper was "Cement Investigations for Boulder Dam with the Results up to the Age of One Year."

Necrology

We announce with regret the death of the following two members:

MORGAN T. JONES, President, Morgan T. Jones Co., Inc., Chicago, Ill. Member since 1911.

R. TRUESDALE, Textile Expert, Dunlop Rubber Co., Ltd., Fort Dunlop, Birmingham, England. Member since 1930.

Junior Members (3)

KELLER, R., Chemist, J. D. Adams Manufacturing Co., Indianapolis, Ind.

LAMBERT, F. S., Chemist, Shawmut Mining Co., St. Marys, Pa.

MOORE, M. B., Testing Engineer, Aluminum Research Laboratories, Aluminum Co. of America, Box 772, New Kensington, Pa.